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EXAMINER	
LEE, SHUN K	
ART UNIT	**PAPER NUMBER**
2878	

DATE MAILED: 12/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/813,858	WOOD ET AL.	
	Examiner	Art Unit	
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-53 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-53 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 22 March 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 600 (Fig. 11a). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because of the length and is more than a single paragraph. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: on pg. 5, "11" in line 18 should probably be --11a--. Appropriate correction is required.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

7. The numbering of claims is not in accordance with 37 CFR 1.75(f) which requires that claims shall be numbered consecutively in Arabic numerals. It is noted that there are two claims numbered 25. The misnumbered claim 25 (lines 13-24 on pg. 34) ~~have~~ has been renumbered 53.

8. Claim 40 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 40 recites the limitation that said substrate comprises a dielectric whereas claim 39 recites the limitation that the substrate is a viscinally cut dielectric material. Thus claim 40 fails to further limit the subject matter of a previous claim.

9. Claims 5, 6, 12, and 14 are objected to because of the following informalities:

(a) "heat" on line 3 of claim 4 and again on line 2 of claim 5 is indefinite and can lead to misinterpretation (if both elements are the same, the later should be identified as --said heat--);

(b) "heat" on line 3 of claim 4 and again on line 2 of claim 6 is indefinite and can lead to misinterpretation (if both elements are the same, the later should be identified as --said heat--);

(c) claim 12 recites the limitation "said dielectric substrate" in line 2 (there is insufficient antecedent basis for this limitation in the claim); and

(d) in claim 14, "impurites" on line 1 should probably be --impurities--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 19-22, 43, and 49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 19, 21, and 43 recite "is selected from the group comprising" renders the claims indefinite because the claims include elements not actually disclosed (those encompassed by "the group comprising"), thereby rendering the scope of the claims unascertainable.

Claim 49 recites the limitation "said insulating layer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

12. Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: a sensor to other elements (it is suggested that "a sensor, " be deleted).

13. Claims 37-49, 50, and 51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant should note that the specification defines a lateral direction (see y axis in Fig. 11a) where a voltage differential is generated (Eq. 18) and measured.

Claim 37 recites the limitation "generating a voltage differential across the sensor in a longitudinal direction which is perpendicular to the plane of the sensor" which is vague and indefinite since it is unclear how the plane is oriented relative to the sensor.

Claims 50 and 51 recite the limitation "longitudinal direction" which is vague and indefinite since it is unclear how the longitudinal direction is oriented relative to the sensor.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

15. Claims 1-19, 21, 23, 24, and 28-30 are rejected under 35 U.S.C. 102(a) as being anticipated by Van Vechten *et al.* (18th International Conference on Thermoelectrics 1999, pg. 477-480).

In regard to claim **1**, Van Vechten *et al.* disclose (Figs. 1 and 4) a detector for detecting a photon, comprising:

(a) a substrate,

(b) a photon absorber (3) disposed upon said substrate,

(c) a thermoelectric sensor (5), disposed upon said substrate and thermally coupled with said photon absorber (3), and

(d) a heat sink (4) disposed upon said substrate, thermally coupled to the thermoelectric sensor (5),

for absorbing a photon and generating a potential across said sensor (5), whereby there is a voltage differential between said absorber (3) and said heat sink (4) in response to said photon absorption (section on "Detector design").

In regard to claim **2** which is dependent on claim 1, Van Vechten *et al.* also disclose (section on "Preliminary Experimental Results") means to measure said voltage differential.

In regard to claim **3** which is dependent on claim 1, Van Vechten *et al.* also disclose (second paragraph in "Double-Pixel Unit" section) that said substrate comprises a dielectric material.

In regard to claim **4** which is dependent on claim 1, Van Vechten *et al.* also disclose (section on "Detector design"; Fig. 2) that responsive to arrival of a photon, said absorber is heated, and the heat in said absorber is transferred to said sensor and further transferred to said heat sink.

In regard to claim **5** which is dependent on claim 4, Van Vechten *et al.* also disclose (section on "Detector design"; Fig. 2) that said heat is transferred from said absorber to said heat sink faster than the heat is transferred from said absorber to said substrate.

In regard to claim **6** which is dependent on claim 5, Van Vechten *et al.* also disclose (section on "Detector design"; Fig. 2) that the time (~10 nsec) for said heat to be transferred from said absorber to said heat sink is about ten times less than the time (~100 nsec) for the heat to be transferred from said absorber to said substrate.

In regard to claim **7** which is dependent on claim 2, Van Vechten *et al.* also disclose (second paragraph in "Conclusions" section) that said means for measuring said voltage differential comprises superconducting leads.

In regard to claims **8** and **9** which are dependent on claim 7, Van Vechten *et al.* also disclose (section on "Preliminary Experimental Results") that said superconducting leads are electrically coupled to the input coil of a flux transformer of a superconducting quantum interference device circuit.

In regard to claim **10** which is dependent on claim 1, Van Vechten *et al.* also disclose (first paragraph in "Double-Pixel Unit" section) that the absorber and the heat sink have the same heat capacity.

In regard to claim **11** which is dependent on claim 10, Van Vechten *et al.* also disclose (first paragraph in "Double-Pixel Unit" section) that the absorber and the heat sink are alike in material and geometry.

In regard to claim **12** which is dependent on claim 1 in so far as understood, Van Vechten *et al.* also disclose (section on "Preliminary Experimental Results") that said thermoelectric sensor comprises a thin film disposed upon said substrate.

In regard to claim **13** which is dependent on claim 1, Van Vechten *et al.* also disclose (section on "Preliminary Experimental Results") that said thermoelectric sensor comprises a material with isotropic thermoelectric properties.

In regard to claim **14** which is dependent on claim 12, Van Vechten *et al.* also disclose (section on "Preliminary Experimental Results") that said thin film comprises gold with impurities.

In regard to claim **15** which is dependent on claim 12, Van Vechten *et al.* also disclose (section on "Preliminary Experimental Results") that said thin film comprises gold with iron impurities between about 10 ppm and 100 ppm.

In regard to claim **16** which is dependent on claim 12, Van Vechten *et al.* also disclose (third paragraph in "Introduction" section) that said thin film comprises a metal (*e.g.*, Au,Fe or Au, Mn) with a Seebeck coefficient of at least about 10 μV/K at an operating temperature of said detector.

In regard to claim **17** which is dependent on claim 12, Van Vechten *et al.* also disclose (third paragraph in "Introduction" section) that said thin film comprises a metal

(*e.g.*, Au,Fe or Au, Mn) with a Seebeck coefficient of between about 10 μV/K and about 80 μV/K at an operating temperature of said detector.

In regard to claim **18** which is dependent on claim 12, Van Vechten *et al.* also disclose (third paragraph in "Introduction" section and section on "Preliminary Experimental Results") that said thin film comprises lanthanum cerium hexaboride.

In regard to claim **19** which is dependent on claim 1 in so far as understood, Van Vechten *et al.* also disclose (Fig. 4) that said photon absorber comprises of a material selected from the group of Be, As, Sb, Bi, Au, Ag, and W.

In regard to claim **21** which is dependent on claim 1 in so far as understood, Van Vechten *et al.* also disclose (Fig. 4) that said heat sink comprises of a material selected from the group of Be, As, Sb, Bi, Au, Ag, and W.

In regard to claim **23** which is dependent on claim 1, Van Vechten *et al.* also disclose (second paragraph in "Double-Pixel Unit" section) a superconducting element (*i.e.*, superconducting strip in Fig. 1) electrically coupled to the heat sink and the photon absorber.

In regard to claim **24** which is dependent on claim 1, Van Vechten *et al.* also disclose (Figs. 1 and 4) that said sensor (5) is between said absorber (3) and said heat sink (4).

In regard to claim **28** in so far as understood, the method steps are implicit for the apparatus of Van Vechten *et al.* since the structure is the same as the applicant's apparatus of claim 3.

In regard to claim **29** which is dependent on claim 1, Van Vechten *et al.* also disclose (Eq. 9) that said sensor has a resistance R which is less than r_0L_0/T^2A_{abs}, where r_0 is the Kapitza resistance constant between the absorber and the substrate, L_0 is the Lorenz number, T is the operating temperature of the detector, and A_{abs}, is the cross sectional area of the absorber.

In regard to claim **30** which is dependent on claim 29, Van Vechten *et al.* also disclose that said r_0 is about 20 K^4cm^2/W (first paragraph in "Signal to Noise ratio" section) and said L_0 is about 25 nW-Ω/K^2 (second paragraph in "Introduction" section).

16. Claims 37-43, 46-48, 50, and 51 are rejected under 35 U.S.C. 102(a) as being anticipated by Gulian *et al.* (IEEE Trans. on Applied Superconductivity 1999, 9:3194-3197) in so far as understood.

In regard to claim **37**, Gulian *et al.* disclose (Fig. 4) a photon detector comprising:

(a) a substrate, and

(b) a thermoelectric sensor comprising a thin anisotropic superconducting film (section II), disposed upon the substrate,

for receiving photons and for generating a voltage differential across the sensor in a longitudinal direction which is perpendicular to the plane of the sensor.

In regard to claim **38** which is dependent on claim 37, Gulian *et al.* also disclose (section II) that the Seebeck coefficient of the sensor in one direction is larger than in other directions.

In regard to claims **39** and **40** which are dependent on claim 38, Gulian *et al.* also disclose (section III) that the substrate is a viscinally cut dielectric material having a tilt angle less than about 45 degrees between the sensor's a-b plane and longitudinal axis.

In regard to claim **41** which is dependent on claim 37, Gulian *et al.* also disclose (section II) that said thin anisotropic superconducting film has an effective length L in the longitudinal direction much greater than its thickness.

In regard to claim **42** which is dependent on claim 37, Gulian *et al.* also disclose (section II) that said thin anisotropic superconducting film comprises a oxide-layered superconducting film in normal state.

In regard to claim **43** and **46** which are dependent on claim 42, Gulian *et al.* also disclose (section II and References 4-11) that said oxide-layered superconducting film comprises of a material selected from the group of YBaCuO (*i.e.*, $YBa_2Cu_3O_7$), LaCuO, and LaBaCuO.

In regard to claim **47** which is dependent on claim 37, Gulian *et al.* also disclose (first four paragraphs in section IV) an insulating layer disposed upon said sensor and a normal-metal absorber disposed upon said insulating layer, said absorber for absorbing incident photons, and said insulating layer for preventing electrical shorts between portions of said sensor.

In regard to claim **48** which is dependent on claim 47, Gulian *et al.* also disclose (sixth paragraph in section IV) that said normal-metal absorber is tungsten.

In regard to claim **50**, Gulian *et al.* is applied as in claims 39 and 42 above. Gulian *et al.* also disclose (section III) a viscinally cut dielectric substrate having a tilt angle of about 5 degrees.

In regard to claim **51**, Gulian *et al.* is applied as in claims 39 and 47 above. Gulian *et al.* also disclose (third paragraph in section III) a viscinally cut dielectric substrate having a tilt angle of less than about 5 degrees.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

19. Claims 20, 22, 25, 26, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Vechten *et al.* (18th International Conference on Thermoelectrics 1999, pg. 477-480) in view of Blomberg *et al.* (US 6,177,673).

In regard to claim **20** which is dependent on claim 19 in so far as understood, the detector of Van Vechten *et al.* lacks that said photon absorber comprises bismuth. Photon absorbers are well known in the art. For example, Blomberg *et al.* teach (column 1, lines 35-38) it is well known in the art that broadband photon absorbers comprise of bismuth. Therefore it would be obvious to one of ordinary skill to provide a photon absorber comprising bismuth in the detector of Van Vechten *et al.*, in order to obtain a broadband photon absorber.

In regard to claim **22** which is dependent on claim 21 in so far as understood, the detector of Van Vechten *et al.* lacks that said heat sink comprises bismuth. Photon absorbers are well known in the art. For example, Blomberg *et al.* teach (column 1, lines 35-38) it is well known in the art that broadband photon absorbers comprise of bismuth. Van Vechten *et al.* also disclose (first paragraph in "Double-Pixel Unit" section) that the absorber and the heat sink are alike in material and geometry and have the same heat capacity. Therefore it would be obvious to one of ordinary skill to provide a photon absorber comprising bismuth and a heat sink comprising bismuth in the detector of Van Vechten *et al.*, in order to obtain a broadband photon absorber and a heat sink that are alike in material and geometry and have the same heat capacity.

In regard to claim **25**, Van Vechten *et al.* is applied as in claim 15 above and Van Vechten *et al.* in view of Blomberg *et al.* is applied as in claim 22 above. Van Vechten *et al.* also disclose (second paragraph in "Double-Pixel Unit" section) that said substrate comprises a dielectric material. The modified detector of Van Vechten *et al.* lacks an explicit description that the dielectric material is a silicon.

Silicon substrates are well known in the art. Therefore it would be obvious to one of ordinary skill to provide a known silicon substrate as the substrate in the modified detector of Van Vechten *et al.*

In regard to claim **26**, Van Vechten *et al.* in view of Blomberg *et al.* is applied as in claim 25 above. Van Vechten *et al.* also disclose (fourth paragraph in "Introduction" section) a photon metallic absorber comprising the metal Sb. The modified detector of Van Vechten *et al.* lacks that the absorber and heat sink have a width of 18 μm, a length of 22 μm, a thickness of 0.2 μm, and that the sensor have dimensions of 2 μm in width, 26 μm in length, and 0.5 μm in thickness. However, Van Vechten *et al.* also disclose ("Electron-Phonon Decoupling", "Signal to Noise Ration", and "Double Pixel Unit" sections) how to size the sensor, absorber, and heat sink to achieve a desired signal duration and signal to noise ratio. Therefore it would be obvious to one of ordinary skill to size the sensor, absorber, and heat sink in the modified detector of Van Vechten *et al.* in order to achieve a desired signal duration and signal to noise ratio.

In regard to claim **53**, Van Vechten *et al.* is applied as in claim 18 above and Van Vechten *et al.* in view of Blomberg *et al.* is applied as in claim 22 above. The modified detector of Van Vechten *et al.* lacks an explicit description that the dielectric material is a silicon. Silicon substrates are well known in the art. Therefore it would be obvious to one of ordinary skill to provide a known silicon substrate as the substrate in the modified detector of Van Vechten *et al.*

20. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Vechten *et al.* (18th International Conference on Thermoelectrics 1999, pg. 477-

480) in view of Blomberg *et al.* (US 6,177,673) as applied to claim 26 above, and further in view of Kampwirth *et al.* (US 4,266,008) and Rosheim (US 4,691,973).

In regard to claim **27** which is dependent on claim 26, Van Vechten *et al.* also disclose (second paragraph in "Conclusions" section) that superconducting electric leads attached to said heat sink and to said absorber for measuring said voltage differential (see voltage in Fig. 1). The modified detector of Van Vechten *et al.* lacks the superconducting electric leads are niobium. Superconducting electric leads such as niobium are well known in the art. For example, Kampwirth *et al.* teach (column 2, lines 42-45) that superconducting electric leads comprise niobium. As another example, Rosheim teaches (column 1, lines 6-31) that superconducting electric leads comprise niobium. Therefore it would be obvious to one of ordinary skill that the superconducting electric leads in the modified detector of Van Vechten *et al.* are well known superconducting electric leads such as niobium superconducting electric leads.

21. Claims 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Vechten *et al.* (18th International Conference on Thermoelectrics 1999, pg. 477-480) in view of Lehovec (US 3,748,479).

In regard to claims **31-33** and **36**, Van Vechten *et al.* is applied as in claim 1 above. The photon detector (or photon detector array) of Van Vechten *et al.* lacks that the photon absorber, the heat sink, and the thermoelectric sensor are disposed on the edge of the wafer and a voltage differential measuring means disposed upon a face of the wafer. Multichip integrated circuit packages for detectors are well known in the art. For example, Lehovec teaches (column 1, line 10 to column 2, line 13) to dispose

photodetectors on the edge of a slab (*i.e.*, wafer) and to dispose associated electrical circuitry upon a face of the slab (*i.e.*, wafer) in order to provide each photodetector with its own individual electrical circuitry. Therefore it would be obvious to one of ordinary skill to dispose the photon absorber, the heat sink, and the thermoelectric sensor on the edge of the substrate and to dispose the voltage differential measuring means upon a face of the substrate in the detector of Van Vechten *et al.*, in order to provide each photon detector with its own individual voltage differential measuring means.

In regard to claims **34** and **35** which are dependent on claim 33, Van Vechten *et al.* also disclose (section on "Preliminary Experimental Results") that said voltage differential measuring means comprises a SQUID array amplifier (*i.e.*, semiconductor electronics).

22. Claims 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gulian *et al.* (IEEE Trans. on Applied Superconductivity 1999, 9:3194-3197) in view of Himpsel (US 5,296,458) in so far as understood.

In regard to claims **44** and **45** which are dependent on claim 42, the detector of Gulian *et al.* lacks an explicit description that said oxide-layered superconducting film comprises $La_2CuO_{4+\delta}$ or $La_{2-x}Ba_xCuO_4$. However, copper oxide layered superconductors such as $La_2CuO_{4+\delta}$ or $La_{2-x}Ba_xCuO_4$ are well known in the art. For example, Himpsel teach (column 1, lines 17-46; column 3, lines 56-64) it is well known in the art that oxide-layered superconductors comprise $La_2CuO_{4+\delta}$ or $La_{2-x}Ba_xCuO_4$. Therefore it would be obvious to one of ordinary skill to provide a well known copper oxide layered superconductor (*e.g.*, $La_2CuO_{4+\delta}$ or $La_{2-x}Ba_xCuO_4$) as the oxide-layered

superconductor in the detector of Gulian *et al.*, in order to fabricate an anisotropic sensor.

23. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gulian *et al.* (IEEE Trans. on Applied Superconductivity 1999, 9:3194-3197) in so far as understood.

In regard to claim **49** which is dependent on claim 37, the detector of Gulian *et al.* lacks a non-electrically conducting absorber disposed upon said sensor, said absorber for absorbing photons. Gulian *et al.* also disclose (fourth paragraph in section IV) an insulated absorber (*i.e.*, a non-electrically conducting absorber) so as to prevent shorting out the sensor. Therefore it would be obvious to one of ordinary skill to provide a non-electrically conducting absorber in the detector of Gulian *et al.*, in order to prevent shorting out the sensor.

24. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Vechten *et al.* (18th International Conference on Thermoelectrics 1999, pg. 477-480) in view of Applicant's Admitted Prior Art.

In regard to claim **52** which is dependent on claim 12, the modified detector of Van Vechten *et al.* lacks that said thin film comprises CeNiSn. Materials having a large seebeck coefficient such as CeNiSn are well known in the art. For example, applicant admits as Prior Art (pg. 16, lines 3-8) it is known in the art that CeNiSn have a large seebeck coefficient (*e.g.*, ~60 μV/K). Therefore it would be obvious to one of ordinary skill to provide a high seebeck coefficient (*e.g.*, CeNiSn) material for the thin film in the

detector of Van Vechten *et al.* in order to achieve a desired signal duration and signal to noise ratio.

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Tuesday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SL
December 26, 2002

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800